CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1995
DateRun:	09/27/1995
Experimenters:	Donald Garlotta, Jay Jankauskas
ClientType:	Water Treatment Company
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Greases
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	Does catalytic water treatment improves cleaning
Experimental Procedure:	The purpose of this trial is to determine if the catalytic water treatment of the Hydrocat improves cleaning efficiencies of various aqueous cleaners. The four different cleaning chemistries used were: -WR Grace Daraclean #283 @ 10% by volume -Oakite Products Inproclean #3800 @ 10% by volume -Calgon Corp. Geo-Guard 3015 @ 10% by volume -Valtech Valtron SP2275 @ 10% per volume Two beakers of each cleaning chemistry were made up (one with Hydrocat treated water and the other with ordinary tap water). Three coupons were cleaned in each beaker of cleaning solution for a total of 24 coupons. Cleaning was performed for 10 minutes at 140 F (give or take 5 F) using stir-bar agitation. A constant setting on the stir plate was used on all beakers to ensure that all solutions obtained equal agitation. Rinsing was performed in a tap water tank without agitation for 2 minutes at 140 F. Coupons were then run under air knives for two minutes and placed in a convection oven where they were left until they were dry. Each coupon was weighed before and after contamination and after drying to obtain a percentage removal of the Valvoline Bearing Grease. After cleaning the beakers of cleaning solutions were covered with parafilm and left out on a counter for a few weeks. The beakers were inspected periodically to see if the Hydrocat treated solutions would retain a longer bath life than the tap-water solutions.

Results:

GRAVIMETRIC RESULTS

Cleaning Solution: 10% solution of Daraclean 283 made up with Hydrocat water

Cleaning Temperature (^{O}F): 137

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
4	60.4253	60.6091	60.5485	0.0606	32.97%
28	59.9562	60.0914	60.0486	0.0428	31.66%
6	60.4893	60.5923	60.5294	0.0629	61.07%
				Average	41.90%
				StDev.	16.61%

Cleaning Solution: 10% solution of Daraclean 283 made up with tap water

Cleaning Temperature (^{O}F): 140

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
10	60.0194	60.1828	60.1468	0.0360	22.03%
11	60.7135	60.8512	60.7826	0.0686	49.82%
12	60.2832	60.4391	60.3248	0.1143	73.32%
				Average	48.39%
				StDev.	25.67%

Cleaning Solution: 10% solution of Valtech Corp. Valtron SP-2275 made up with Hydrocat water.

Cleaning Temperature (^{O}F): 136

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sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
19	60.2250	60.3664	60.2257	0.1407	99.51%
20	60.4810	60.6690	60.4838	0.1852	98.51%
21	60.2299	60.4352	60.2303	0.2049	99.81%
				Average	99.27%
				StDev.	0.68%

Cleaning Solution: 10% solution of Valtech Corp. Valtron SP-2275 made up with tap water.

Cleaning Temperature (^{O}F): 141

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
7	59.9125	60.0206	59.9131	0.1075	99.45%
8	60.1149	60.2732	60.1159	0.1573	99.37%
9	60.6615	60.7640	60.6621	0.1019	99.41%
				Average	99.41%
				StDev.	0.04%

Cleaning Solution: 10% solution of Oakite Inproclean 3800 made up with Hydrocat water.

Cleaning Temperature (^{O}F): 142

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
25	60.5273	60.6699	60.5481	0.1218	85.41%
26	59.3082	59.4589	59.3220	0.1369	90.84%
27	60.2475	60.4193	60.2853	0.134	78.00%
				Average	84.75%
				StDev.	6.45%

Cleaning Solution: 10% solution of Oakite Inproclean 3800 made up with tap water.

Cleaning Temperature (^{O}F): 140

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
13	60.3423	60.4886	60.3585	0.1301	88.93%
14	60.5448	60.6613	60.5483	0.113	97.00%
15	60.7070	60.8114	60.7076	0.1038	99.43%
				Average	95.12%
				StDev.	5.50%

Cleaning Solution: 10% solution of Calgon Geo-Guard #2215 made up with Hydrocat water.

Cleaning Temperature (^{O}F): 134

sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
22	60.0150	60.2408	60.2377	0.0031	1.37%
23	60.1111	60.2510	60.2484	0.0026	1.86%
24	60.2343	60.4101	60.4076	0.0025	1.42%
				Average	1.55%
				StDev.	0.27%

Cleaning Solution: 10% solution of Calgon Geo-Guard #2215 made up with tap water.

Cleaning Temperature (^{O}F): 136

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sample #	clean mass (g)	mass with contamination (g)	mass after cleaning (g)	contaminant removed (g)	Percent Removal
16	60.5809	60.8138	60.8105	0.0033	1.42%
17	60.3642	60.5162	60.5146	0.0016	1.05%
18	59.9102	60.0517	60.0479	0.0038	2.69%
				Average	1.72%
				StDev.	0.86%

Summary:

Substrates:	Stainless Steel				
Contaminants:	Greases				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Magnaflux	Daraclean 283	10	41.90	☐	
Oakite Products	Inproclean 3800	10	84.75	☐	
Valtech Corporation	Valtron SP 2275	10	99.27	☐	
Calgon Corporation	Geo Guard 3015	10	1.72	☐	
Magnaflux	Daraclean 283	10	48.39	☐	w/ Hyrdocoat
Oakite Products	Inproclean 3800	10	95.12	☐	w/ Hyrdocoat
Valtech Corporation	Valtron SP 2275	10	99.41	☐	w/ Hydrocoat
Calgon Corporation	Geo Guard 3015	10	1.55	☐	w/ Hydrocoat

Conclusion:

No noticeable improvements in cleaning efficiency were obtained by making up a cleaner solution with Hydrocat treated water.
On October 16th, cleaning solutions were inspected again to see if the bath lives of cleaner solutions were increased at all due to the water treatment of the hydrocat. Both beakers of the WR Grace #211 and the Valtron SP2275 were starting to cloud up indicating that they were starting to go bad. There was no noticeable difference in the cloudiness of the solutions made up with Hydrocat-treated water and the solutions made up with tap-water.